

# Clinical Outcomes following Proximal Hamate Reconstruction of Proximal Pole Scaphoid Nonunions: A Case Series

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## INTRODUCTION:

Proximal hamate osteochondral autograft for reconstruction of proximal scaphoid fracture nonunion can lead to union and satisfactory patient-reported outcomes (PROs) and improved range of motion (ROM).

## METHODS:

A retrospective review identified patients treated with this surgery with a minimum 6-month follow up. Primary clinical outcomes included: duration of nonunion, wrist and forearm ROM, time to radiographic union, and PROs. Descriptive statistics were performed to report mean, range, and standard error for patient demographics, mechanism of injury, functional outcomes of the PRO surveys, and follow-up timeframe.

## RESULTS:

Four patients were included with a mean age of 24 years old (75% male). Two patients had a failed prior surgical intervention at an outside hospital. The mean interval time to reconstruction was 3.9 years (range, 0.6-9). All achieved radiographic union by 12 weeks. The average ROM achieved on flexion/extension and supination/pronation was 67.5% and 100%, respectively, as compared to the contralateral side. The mean Disabilities of the Arm, Shoulder, and Hand (*QuickDASH*) score was 17.6 (SD, 13). No complications were identified (Table 1 and Figure 1).

Table 1. Current study demographics and outcomes. Note: M, male; F, female; R, right; L, left; K, Kirschner; CL, capitulate; SC, scaphocapitate; SL, scapholunate; ROM, range of motion; F, flexion; E, extension; S, supination; P, pronation; VAS, visual analog scale; SF-12, 12-item short-form survey; PCS, physical component score; MCS, mental component score; *QuickDASH*, Disabilities of the Arm, Shoulder, and Hand score; ISA, intrascaphoid angle; SLA, scapholunate angle; CLA, capitulate angle; RLA, radiolunate; mm, millimeters; UTA, unable to assess due to lack of computed tomography.

Figure 1. A-B) Preoperative and C-D) postoperative anteroposterior and lateral X-rays of all cases 1 through 4 from top to bottom row. Case # 4, has the lateral preoperative x-ray view missing.

## DISCUSSION AND CONCLUSION:

This surgical technique allows minimal donor site morbidity, no additional incisions with no significant risk of adverse events, a sizeable graft that can be rigidly fixed to the scaphoid, no need for microvascular technique, and the harvest of the stout volar capitolunate ligament to repair the dorsal aspect of the scapholunate ligament. All cases achieved a union of the proximal scaphoid pole reconstruction with proximal hamate osteochondral autograft. Motion achieved 67% of the contralateral side in flexion/extension. PRO demonstrated minimal disability with no reported complications or secondary procedures at 12.8-month average follow up.



Table 1. Current study demographics and outcomes.

Case	Age/Sex (Age)	Non-union time at presentation (months)	Type of fixation	Size of hamate graft (length x width mm)	Supplementary fixation	SL retractor pair	Radiographic union and time to union (weeks)	Latest clinical follow up (months)	ROM affected joint: F/E/S/P (at latest follow up) F+E+S+P (%)	ROM at latest follow up: F+E+S+P (%)	VAS Last 24 hours/Rest/active	SF-12 PCS/MCS	QDASH	Preoperative SLA/CLA/RLA	Postoperative SLA/CLA/RLA
1	18/M	12	Capitulated screw x2	8.7 x 7.6	CL and SC K-wire transformation for 6 weeks	Repair	Yes, 12	11 months	65/0/0/0	74/100	0/0/0	29.1/62.1	29.5	85/17/32	60/15/30
2	35/M	108	Capitulated screw x2	10.6 x 9	CL K-wire transformation for 6 weeks	Repair and suture anchor x2	Yes, 10	6 months	45/50/0/0	63/100	3/7/4	38.4/60.3	27.3	55/15/12	50/12/5
3	20/M	8	Capitulated screw x2	10.6 x 8.8	CL K-wire transformation for 12 weeks	Repair and suture anchor x2	Yes, 12	14 months	60/0/0/0	71/100	0/0/0	47.5/47.9	11.4	85/17/37	65/15/30
4	23/F	60	Capitulated screw x2 and K-wire x 1	8 x 6.7	SC and SL K-wire transformation for 12 weeks	Repair and capsulotomies	Yes, 12	20 months	40/50/0/0	62/100	0/0/0	50.8/55	2.3	87/25/20	45/15/17